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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/723,696	11/26/2003	Andreas Menkhoff	1890-0015	7838

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EXAMINER	
GHULAMALI, QUTBUDDIN	
ART UNIT	**PAPER NUMBER**
2611	

MAIL DATE	DELIVERY MODE
03/05/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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Office Action Summary	Application No.	Applicant(s)	
	10/723,696	MENKHOFF, ANDREAS	
	Examiner	Art Unit	
	Qutbuddin Ghulamali	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 November 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 3-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *19-23* is/are allowed.

6)☒ Claim(s) *1,7,9, 12, 17 and 18* is/are rejected.

7)☒ Claim(s) *3-6,8,10,11 and 13-16* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This Office Action is in response to the remarks filed 11/23/2007.

2. The applicant's amendment of claims 1, 18 and 19, is acknowledged and objection to these claims is hereby withdrawn.

Response to Remarks

3. Applicant's remarks (see page 9-11), filed 11/23/2007, with respect to the rejection of claims 1, 17 and 18, under 35 U.S.C. 103 (a), have been fully considered However, they do not place the application in condition for allowance. The indication of allowable subject cited in the previous office action regarding claims 2-16 is hereby regretfully withdrawn. The rejection follows.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1, 7, 9, 12, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Niimi (USP 4,084,472) in view of applicant's admitted prior art (AAPA).

Regarding claims 1, 7, 12, 18 Niimi discloses a method for generating multiplier coefficients comprising:

(a) performing recursive calculation of a multiplier set (MS) (respective partial tones or set of particular frequencies) (col. 1, lines 25-59);

(b) selecting a multiplier group (MG) consisting of a number of multipliers from the calculated multiplier set (MS) (Niimi discloses fig. 3, tone sample composer 610 includes a memory 611 for storing relative amplitudes a_m (m=1 to M) of the partial tones, a multiplier 612 for multiplying the normalized partial tone sample value $f_{m0}(nT)$ by the amplitude a_m and the accumulator 613 for accumulating a predetermined group of outputs of multiplier 612 to form a sample tone value, col. 7, lines 5-29). Niimi however does not explicitly disclose dependence on a predetermined signal/noise ratio (SNR_{NoM}) of the mixer. A mixer is associated with undesired spurious noise resulting from non-linear properties inherent to mixers and therefore any input to it depend on a predetermined signal to noise figure, is well known in communication art.

(c) writing multiplier coefficients (MC) (multiplying the respective recursion coefficients pm and qm and storing M pairs of initial function value into a memory of the mixer in accordance with the selected multiplier group (MG) (col. 1, lines 48-65; col. 2, lines 45-59);

Regarding claim limitation (d) initialization of a first multiplier V_0 to 0 and initialization of a second multiplier V_1 to 1, is design based, there is no criticality in selecting the initial values of 0 and 1 as this is a matter of design choice depending on achieving lower multiplied coefficient count and better accuracy. As to use of recursive form, $V_{i+2} = V_i +$

$V_{i+1,}$ for i = 0, 1, 2...$i_{max.}$ Niimi does not explicitly disclose the recursive form or equation. However, Niimi discloses m_{th} partial tone is calculated from preceding two samples and in such recursive calculation, the shapes of the partial tone functions can be varied widely depending on the selection of the parameters p_m and q_m (see col. 1, lines 48-65). The selection of constants, p_m and q_m, is designed based and it would therefore, have been obvious to a person of skill in the art to select any desired values, such as 1 for both parameters p_m and q_m so as to arrive at the desired result. As to the use of a 1:m mixer, a conventional mixer is disclosed in the AAPA, where m can be 8 or 10 (see AAPA, page 1, lines 25-26). Therefore, a person of ordinary skill in the art at the time of invention would be motivated to use a conventional 1:m mixer wherein m could be selected to represent a ratio of 8 or 10 as disclosed in AAPA, to recursively calculate coefficients in the circuit of Niimi to obtain desired accuracy.

Regarding claim 9, Niimi discloses

writing the following multiplier coefficients (MC):into the memory of the mixer:

MC = (0, Vi, Vi +I, Vi, O, -Vi, -Vi+1, -Vi) (col. 2, lines, 50-64)

6. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Niimi (USP 4,084,472) in view of AAPA, and further in view of DesJardins et al (US Patent 6,219,815).

Regarding claim 17, Niimi and AAPA disclose all limitations of the claim above except does not explicitly disclose use of Horner coefficients to the result of multiplication of multipliers. However, DesJardins discloses implementation of Horner

coefficients to the result of the multiplication products by adding coefficient values c.sub.0, c.sub.k, c.sub.2k, etc. to the result of the multiplication products c.sub.k X.sup.k, c.sub.2k X.sup.2k c.sub.3k X.sup.3k, etc. (col. 15, lines 15-25). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use Horner coefficients as taught by DesJardins in the combined system of Niimi and AAPA because it can improve coefficient evaluation by simultaneously evaluating a number of multipliers or other sub-polynomials in the group.

Reason for Allowance

7. Claims 19-23 allowed.

8. Claims 3-6, 8, 10-11, 13-16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten to include all of the limitations of the base claim and any intervening claims.

9. The following is an examiner's statement of reasons for allowance:

The prior art made of record in combination with other claimed limitations neither teaches nor renders obvious the inclusion of limitation, the calculating circuit having a number of dividing circuits for dividing the digital input signal applied to an input of the mixer, and a number of switchable adders/subtractors, wherein dividing factors of the dividing circuits are Homer coefficients of the calculating multipliers of the multiplier group, and adders/subtractors are controlled in dependence on a first control bit (SUB/ADD) read out of a memory of the mixer; a demultiplexer for switching through a

zero value or the multipliers calculated by the calculating circuit in dependence on a second control bit (zero) read out of the memory; and (c) a sign circuit for outputting the positive or negative value switched through by the demultiplexer to an output of the mixer in dependence on a third control bit (SIGN) read out of the memory. Such limitations as recited in claim 19, is neither anticipated nor rendered obvious by the prior art made of record.

The claims 20-23, are allowed by virtue of their dependency to base claims highlighted above.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Contact Information

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Qutbuddin Ghulamali whose telephone number is (571)-272-3014. The examiner can normally be reached on Monday-Friday, 7:00AM - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh M. Fan can be reached on (571) 272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

QG.
February 18, 2008.

CHIEH M. FAN
SUPERVISORY PATENT EXAMINER